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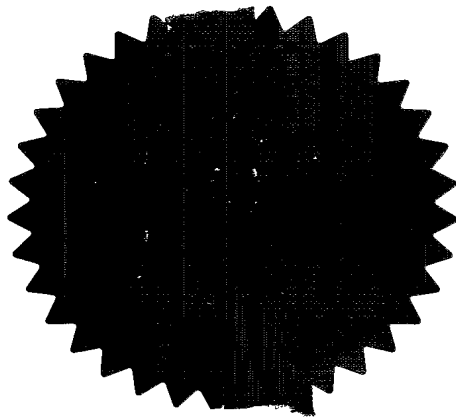
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2. Patent application number
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3. Full name, address and postcode of the or of each applicant (underline all surnames)
ROBERTSON, Stewart
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West Glen Road
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Patents ADP number (if you know it)

6935456001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention
Dispenser

5. Name of your agent (if you have one)
Murgitroyd & Company
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)
Scotland House
165-169 Scotland Street
Glasgow
G5 8PL

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Continuation sheets of this form	-
Description	12
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Murgitroyd & Company

Date 21/01/2004

12. Name, daytime telephone number and e-mail address, if any, of person to contact in the United Kingdom

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1 **Dispenser**

2

3 This invention relates to a dispenser, and
4 particularly, but not exclusively, to a dispenser
5 for dispensing flowable dentifrice materials onto a
6 toothbrush.

7

8 Conventionally, the task of brushing teeth with a
9 flowable dentifrice material such as a paste or gel
10 involves manually squeezing a deformable tube to
11 deposit the material onto a toothbrush.

12 Alternatively, rigid tubes having a manually
13 operated pump mechanism for dispensing the
14 dentifrice material are also widely used.

15

16 Other known dispensers employ lever and ratchet
17 mechanisms, cantilever arm devices or operate
18 utilising the force of gravity and a winder key
19 dispensing device.

20

21

1 Whilst such devices have provided an improved
2 dispensing means for dentifrice material for the
3 majority of people, there are others who may find
4 such devices cumbersome or awkward to use. For
5 example, young children may have a tendency to
6 squeeze a toothpaste tube too hard and have
7 difficulty in accurately directing the extracted
8 toothpaste onto the toothbrush. The elderly, the
9 infirm and people suffering from arthritis or
10 related complaints may also find the task of
11 manually dispensing a dentifrice material onto a
12 toothbrush rather onerous.

13
14 A further disadvantage of known dispensers is that
15 it is difficult to completely empty the contents of
16 a tube of dentifrice material and consequently a
17 significant amount of wastage is typical.

18
19 According to a first aspect of the present invention
20 there is provided dispensing apparatus comprising an
21 inlet port for coupling to an opening in the neck of
22 a container containing flowable material and an
23 outlet port through which the material is dispensed;
24 the inlet and outlet ports being separated by a
25 conduit, a first one-way valve positioned at the
26 inlet port to permit passage of the material from
27 the container into the conduit and a second one-way
28 valve positioned at the outlet port to permit
29 passage of the material out of the conduit; and
30 means for selectively varying the volume of the
31 conduit between the inlet and outlet ports.

32

1 Preferably, the flowable material is semi-solid
2 material.

3
4 Preferably, the inlet port is adapted to form a
5 hermetically sealed connection with the neck of the
6 container.

7
8 Preferably, an upstanding resilient collar for
9 receiving the neck of the container and forming the
10 hermetic seal is mounted on and surrounds the inlet
11 port.

12
13 Preferably, the resilient collar is annular in
14 shape.

15
16 Preferably, the internal diameter of the resilient
17 collar is tapered.

18
19 Preferably, the resilient collar is made from a
20 silicone material.

21
22 Preferably, a rigid housing surrounds the resilient
23 annular collar.

24
25 Preferably, an annular radial flange projects
26 inwardly from the lower peripheral edge of the rigid
27 housing.

28
29 Preferably, the upper end of the conduit bears on
30 the flange within the rigid housing.

31
32 Preferably, the inlet port is located within the

1 rigid housing and interposed between the conduit and
2 the resilient collar.

3

4 Preferably, the inlet port is perforated.

5

6 Preferably, the first one-way valve is an umbrella
7 valve.

8

9 Preferably, the second one-way valve is a duckbill
10 valve.

11

12 Preferably, the conduit is resiliently deformable.

13

14 Preferably, the resiliently deformable conduit is a
15 bellows pump.

16

17 Preferably, the respective ends of the conduit are
18 axially displaceable relative to each other to
19 selectively vary the volume of the conduit between
20 the inlet and outlet ports.

21

22 Preferably, the dispenser and the container are
23 located within a casing for fixing to a wall.

24

25 Preferably, projections provided on the exterior of
26 the housing are releasably connectable to the
27 casing.

28

29 Preferably, cam surface engaging portions are
30 provided on the outlet port.

31

32 Preferably, the cam surface engaging portions are

1 outwardly projecting pins.

2

3 Preferably, a cradle member is pivotably and
4 releasably mounted on the casing.

5

6 Preferably, cam surfaces provided on the cradle
7 member receive the outwardly projecting pins.

8

9 Preferably, the flowable semi-solid material is
10 dentifrice material.

11

12 Preferably, the cradle member has two side walls and
13 a platform adapted to support a toothbrush head.

14

15 Preferably, the platform is provided with a push
16 surface corresponding to the distal end of the
17 toothbrush head.

18

19 According to a second aspect of the present
20 invention there is provided a method of dispensing
21 dentifrice material from a container using the
22 dispensing apparatus of the first aspect comprising
23 the steps of:

24 (i) coupling the open neck of a container with
25 the inlet port;

26 (ii) priming the dispensing apparatus to remove
27 any air within the apparatus or the container
28 by sequentially reducing and increasing the
29 volume between the inlet and outlet ports; and
30 (iii) reducing the volume between the inlet and
31 outlet ports to force the dentifrice material
32 from the container and through the first one-

1 way valve, the conduit and the second one-way
2 valve respectively.

3

4 Preferably, the step of reducing the volume between
5 the inlet and outlet ports is achieved by applying a
6 force to compress the conduit longitudinally.

7

8 Preferably, the step of applying a longitudinal
9 force is achieved by pivoting a cradle member having
10 cam surfaces about a pivot axis, said cam surfaces
11 moving cam surface engaging portions provided on the
12 outlet port thus moving the outlet port towards the
13 inlet port.

14

15 Preferably, the step of pivoting the cradle member
16 is achieved by placing a toothbrush in the cradle
17 member and applying a force in a direction
18 corresponding to the longitudinal axis of the
19 toothbrush.

20

21 Embodiments of the present invention will now be
22 described, by way of example only, with reference to
23 the accompanying drawings, in which:

24

25 Fig. 1 is a cross-sectional perspective view of
26 the conduit portion of the dispensing
27 apparatus;

28 Fig. 2 is a perspective view of the dispensing
29 apparatus located within its casing; and

30 Figs. 3a, 3b and 3c are cross-sectional views
31 showing the conduit portion of the dispensing
32 apparatus at various stages in its operation.

1
2 The dispensing apparatus comprises a conduit portion
3 as shown in Fig. 1 having an inlet port 10 and an
4 outlet port 12 separated by a deformable conduit in
5 the form of a bellows pump 14. An upstanding
6 resilient collar 16 made from elastic silicone
7 material is mounted on and surrounds the inlet port
8 10. The resilient collar 16 is annular in shape and
9 its inner diameter tapers inwardly towards the inlet
10 port 10. the resilient collar 16 has detents
11 provided on its outer periphery for releasably
12 locating it within a rigid housing 18 to allow
13 removal for cleaning or replacement. The rigid
14 housing 18 is provided with an inwardly projecting
15 annular flange 20 around the periphery of its lower
16 edge.

17
18 The upper end of the bellows pump 14 bears on the
19 flange 20 within the rigid housing 18 and the inlet
20 port 10 is held interposed between the upper end of
21 the bellows pump 14 and the lower surface of the
22 resilient collar 16 by any suitable means for
23 producing a hermetic seal, for example by gluing or
24 hot melt sealing.

25
26 Perforations 20 are provided in the inlet port 10
27 and an umbrella valve 22 selectively opens and
28 closes to allow material to pass through the
29 perforations 20 into the bellows pump 14. The
30 umbrella valve 22 fits within a recessed portion 17
31 located around the lower inner periphery of the
32 collar 16. A duckbill valve 24 positioned within

1 the outlet port 12 selectively opens and closes to
2 allow material to pass through and exit the bellows
3 pump 14.

4
5 The selection of appropriate valves at the inlet and
6 outlet ports 10, 12 is important for effective
7 operation of the dispensing apparatus. For example,
8 the configuration of the umbrella valve 22 is such
9 that it is appropriate for the suction of material
10 into the conduit 14 whilst its profile is such that
11 the valve itself does not substantially extend
12 vertically into the conduit 14. The duckbill valve
13 24 is particularly suitable for use at the outlet
14 port 12 because it provides a directed and even flow
15 of material with a clean cut-off.

16
17 As shown in Fig. 2, the conduit portion of Fig. 1 is
18 located within a casing 26 which is fixed on a wall
19 28. Projections 30 are provided on the exterior
20 surface of the rigid housing 18 and releasably
21 received within corresponding grooves 32 on the
22 casing 26 to allow removal for cleaning or
23 replacement of parts .

24
25 A cradle member 34 is pivotably and releasably
26 mounted to the casing 26 via protrusions 36 formed
27 on its side walls 38 which locate in corresponding
28 apertures in the casing 26. The cradle member 34
29 has cam surfaces 40 formed on its side walls 38
30 which engage with outwardly projecting pins 42 on
31 the outlet port 12.

32

1 In use, the open neck of a container is located
2 within the resilient collar 16 and the elastic
3 nature of the silicone material forms a hermetic
4 seal around the neck. The following description
5 uses the example of dispensing toothpaste from a
6 deformable toothpaste tube. It should however be
7 appreciated that the invention can be used to
8 dispense any other flowable semi-solid material nor
9 is its operation limited for use with only
10 deformable containers.

11
12 A toothbrush head 44 is located on a supporting
13 surface 46 within the cradle member 34 against a
14 push surface 48. In order to dispense toothpaste
15 from the dispensing apparatus, the apparatus must
16 first be primed to remove any air from within the
17 apparatus and toothpaste tube. This is achieved by
18 applying a force in a direction corresponding to the
19 longitudinal axis of the toothbrush to thereby pivot
20 the cradle member 34 relative to the casing 26 about
21 its protrusions 36. The pivoting action causes the
22 outwardly projecting pins 42 on the outlet port 12
23 to slide up the cam surfaces 40 on the cradle member
24 34. In doing so, an upwardly directed force is
25 applied to the outlet port 12 and the bellows pump
26 14 is thereby longitudinally compressed to reduce
27 the volume between the inlet port 10 and the outlet
28 port 12 and expel air from the apparatus and the
29 toothpaste tube via the duckbill valve 24.

30

31 The cradle member 34 returns to its initial position
32 upon withdrawal of the toothbrush head 44 from the

1 push surface 48 by virtue of the resilient nature of
2 the bellows pump 14. It may be necessary to repeat
3 this action several times before all air is expelled
4 from the apparatus and the toothpaste tube.

5
6 Once fully primed, the bellows pump is filled with
7 toothpaste as indicated in Fig. 3a and the
8 dispensing apparatus is ready for use. Further
9 pivotal movement of the cradle member 34 as
10 described above will cause toothpaste to be forced
11 from the bellows pump 14 onto the underlying
12 toothbrush head 44 as indicated in Fig. 3b. The
13 pivot point of the cradle member 34 is positioned
14 forward of the duckbill valve 24 and therefore the
15 toothbrush travels upwards during the pivoting
16 motion. Such a motion aids accurate placement of
17 the toothpaste onto the toothbrush head 44. Upon
18 removal of the toothbrush head 44 from the cradle
19 member 34, the resilient nature of the bellows pump
20 14 returns the apparatus to its original position.
21 During the return motion, further toothpaste is
22 drawn into the bellows pump 14 through the open
23 umbrella valve 22 as shown in Fig. 3c.

24
25 The push stop 48 on the cradle member 34 is also
26 positioned forward of the duckbill valve 24 such
27 that the toothpaste is deposited along the length of
28 the toothbrush head 44 from its distal end to its
29 handle end. The maximum distance through which the
30 toothbrush head 44 can pivot therefore corresponds
31 to the length of a standard toothbrush head.
32 Accordingly, the amount of toothpaste dispensed from

1 the duckbill valve 24 onto the toothbrush head 44 is
2 dictated by the degree to which the cradle member 34
3 is pivoted.

4
5 It will be appreciated that the dispensing apparatus
6 of the present invention can be easily disassembled
7 for cleaning purposes or for replacement of parts.
8 For example, the cradle member 34 may be
9 disconnected from the casing 26 by manually pinching
10 the side walls 38 toward each other thereby moving
11 the protrusions 36 out of engagement from their
12 corresponding apertures 26. Similarly, the rigid
13 housing 18 can be removed from the casing 26 by
14 sliding its projections 30 out of engagement with
15 their corresponding grooves 32.

16
17 It will also be appreciated by those skilled in the
18 art that the dispensing apparatus of the present
19 invention can be operated by only one hand and
20 therefore provides a simple, effective and
21 convenient means of dispensing toothpaste onto a
22 toothbrush. The features of the invention are
23 particularly advantageous for those people, such as
24 the young, the infirm or the elderly who find
25 conventional means of dispensing toothpaste onto a
26 toothbrush difficult to operate.

27
28 Modifications and improvements may be made to the
29 above without departing from the scope of the
30 present invention. For example, the dispenser need
31 not be used exclusively for dentifrice material and
32 could equally be adapted to a dispense a variety of

1 different semi-solids or fluids, e.g. cream, hand-
2 wash, shaving gel, hair gel, washing up liquid and
3 the like.

4

5 The conduit need not be in the form of a bellows .
6 pump and the volume varying means may act in a
7 transverse rather than a longitudinal direction.

8 The cradle member may be adapted to correspond with
9 the material being dispensed. For example, if
10 material is to be dispensed onto a hand (i.e. soap
11 or shaving foam) then an appropriately shaped cradle
12 member would be used.

13

14 Alternative one-way valves could be used at either
15 end of the conduit and the collar could include a
16 threaded aperture to receive a threaded neck of a
17 container.

18

19 Whilst the dispensing apparatus of the present
20 invention has been described to be fixed on a wall
21 in a vertical orientation, it could equally be
22 adapted to operate in other orientations.

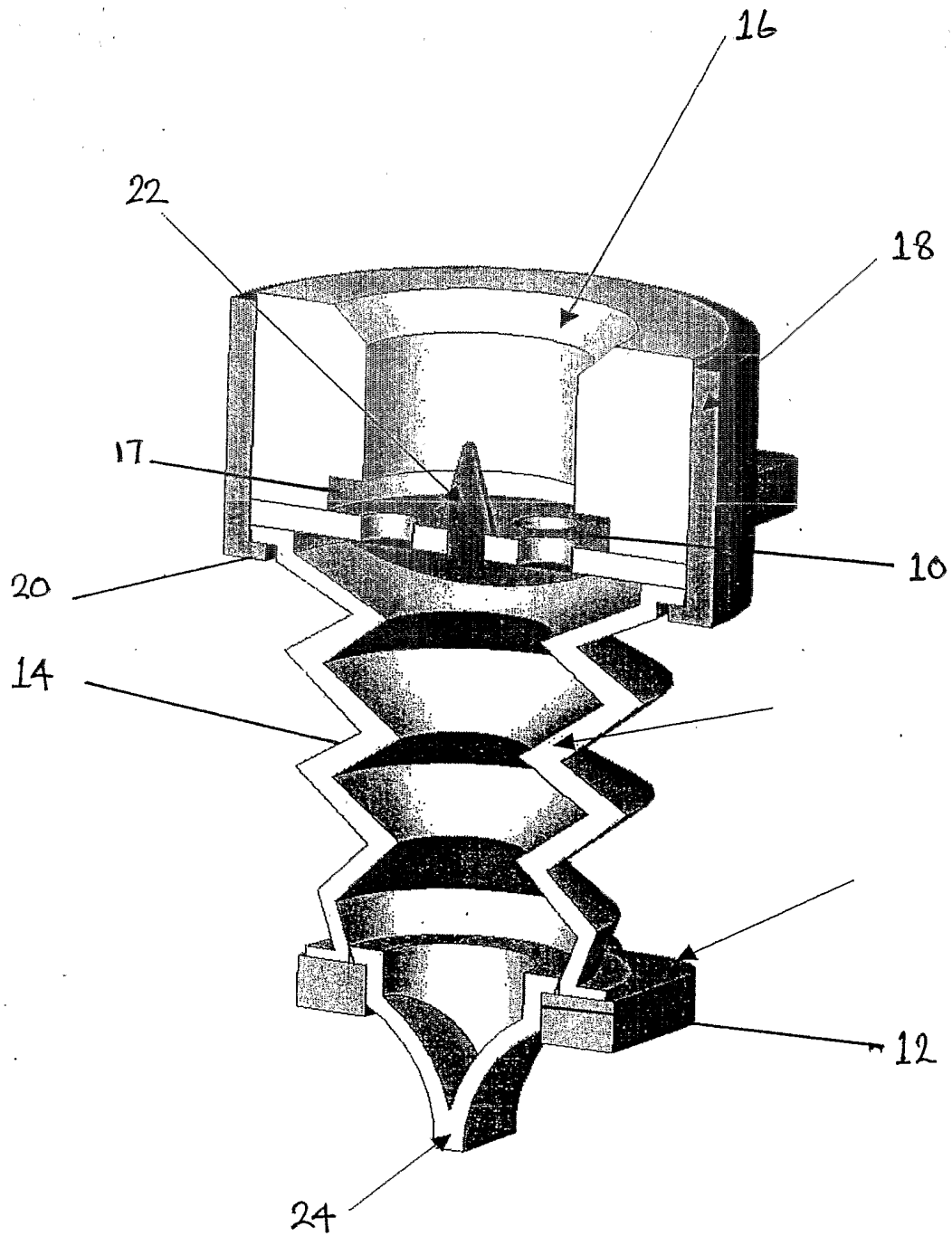


FIG. 1



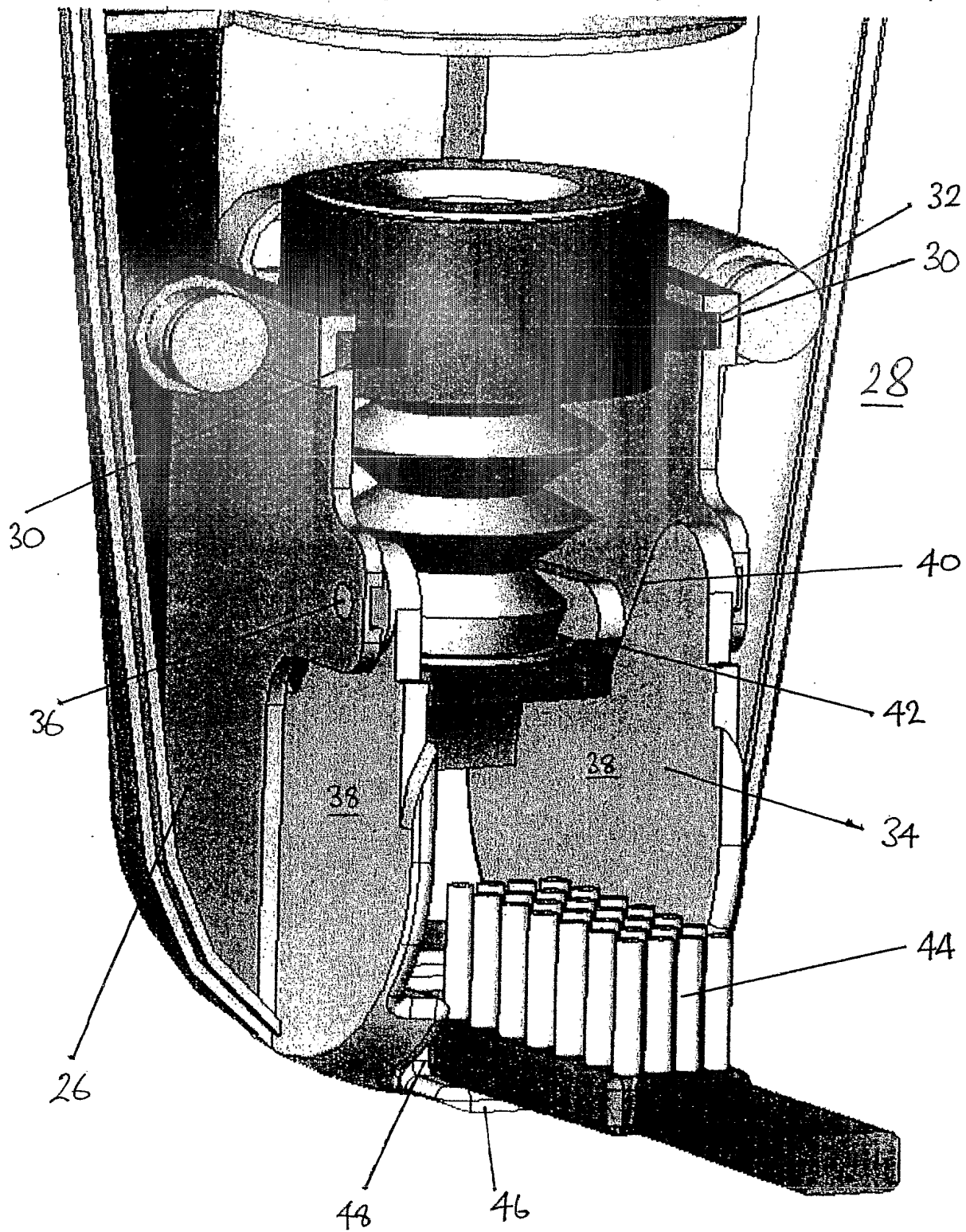


FIG. 2



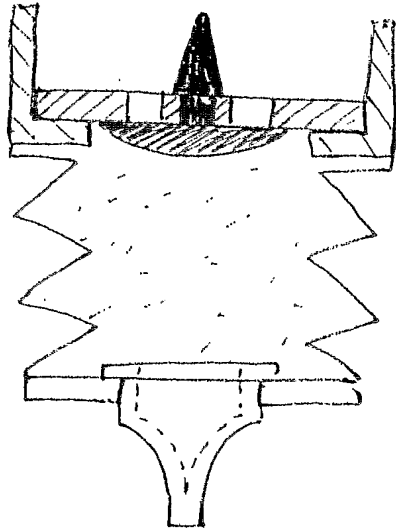


FIG. 3a

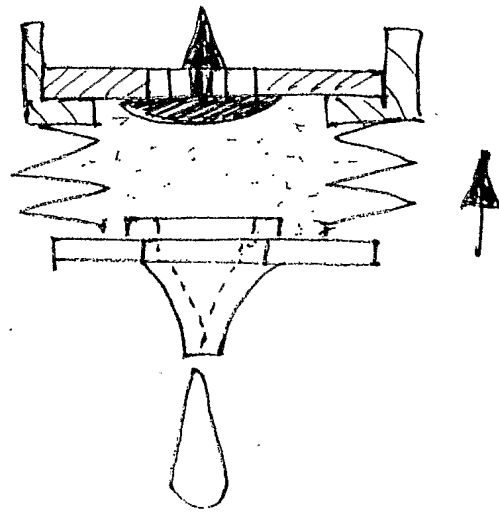


FIG. 3b

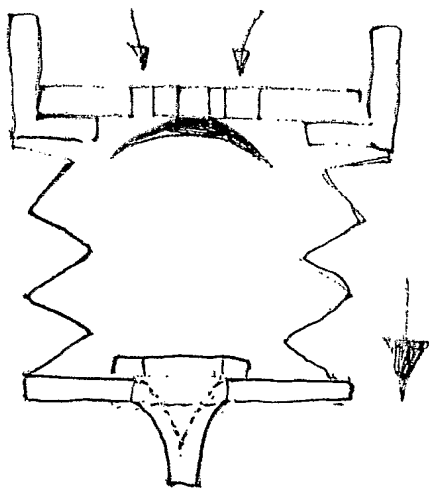


FIG. 3c

